CRMQTL0305A

Description

N-channel Enhancement Mode Power MOSFET

Features

• 30V, 60A

 $R_{DS(ON)}$ Typ=3.5m Ω @ V_{GS} = 10V $R_{DS(ON)}$ Typ=5.1m Ω @ V_{GS} = 4.5V

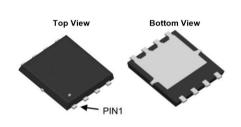
- Advanced Trench Technology
- Excellent R_{DS(ON)} and Low Gate Charge
- Lead Free

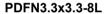
Applications

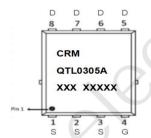
- Load Switch
- PWM Application
- Power Management

100% UIS TESTED! 100% ΔVds TESTED!

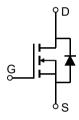








Marking and Pin Assignment



Schematic Diagram

Package Marking and Ordering Information

| Device Marking | Device | Outline | Package | Reel Size | Reel(pcs) | Per Carton (pcs) |
|----------------|-------------|---------|----------------|-----------|-----------|---------------------|
| CRMQTL0305A | CRMQTL0305A | TAPING | PDFN3.3x3.3-8L | 13" | 5000 | 50000 |

Absolute Maximum Ratings (@ T_C = 25°C unless otherwise specified)

| Symbol | Parameter | | Value | Units | |
|---------------------|--------------------------------------|------------------------|------------|-------|--|
| V _{DS} | Drain-to-Source Voltage | | 30 | V | |
| V _{GS} | Gate-to-Source Voltage | | ±20 | V | |
| I _D | Continuous Drain Current | T _C = 25°C | 60 | А | |
| | | T _C = 100°C | 40 | | |
| I _{DM} | Pulsed Drain Current (1) | | 240 | А | |
| E _{AS} | Single Pulsed Avalanche Energ | gy ⁽²⁾ | 110 | mJ | |
| P_D | Power Dissipation | T _C = 25°C | 28 | W | |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | | 4.4 | °C/W | |
| T_{J} , T_{STG} | Junction & Storage Temperature Range | | -55 to 150 | °C | |



CRMQTL0305A

Electrical Characteristics (T_J = 25°C unless otherwise specified)

| Symbol | Parameter | Parameter Conditions | | Тур. | Max. | Unit |
|----------------------|--|--|----------|------|------|------|
| Off Cha | aracteristics | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | $I_D = 250 \mu A, V_{GS} = 0 V$ | 30 | - | - | V |
| I _{DSS} | Zero Gate Voltage Drain Current | $V_{DS} = 30V, V_{GS} = 0V$ | - | - | 1.0 | μА |
| I _{GSS} | Gate-Body Leakage Current | $V_{DS} = 0V, V_{GS} = \pm 20V$ | - | - | ±100 | nA |
| On Cha | aracteristics | | | | | |
| V _{GS(th)} | Gate Threshold Voltage | $V_{DS} = V_{GS}, I_{D} = 250 \mu A$ | 1.0 | 1.5 | 2.0 | V |
| R _{DS(ON)} | Static Drain-Source ON-Resistance ⁽³⁾ | $V_{GS} = 10V, I_D = 30A$ | - | 3.5 | 4.6 | mΩ |
| | | $V_{GS} = 4.5V, I_D = 20A$ | - | 5.1 | 6.8 | mΩ |
| Dynam | ic Characteristics | | | | | |
| C _{iss} | Input Capacitance | | - (| 2400 | - | pF |
| C _{oss} | Output Capacitance | $V_{GS} = 0V, V_{DS} = 15V,$ f = 1MHz | | 263 | - | pF |
| C_{rss} | Reverse Transfer Capacitance | | - | 200 | - | pF |
| Q_g | Total Gate Charge | | _ | 42 | - | nC |
| Q_{gs} | Gate Source Charge | $V_{GS} = 0 \text{ to } 10V$ | <u> </u> | 9 | - | nC |
| Q_{gd} | Gate Drain("Miller") Charge | $V_{DS} = 15V, I_{D} = 30A$ | - | 10 | - | nC |
| | | | | | | |
| Switchi | ing Characteristics | | | | | |
| t _{d(on)} | Turn-On DelayTime | | - | 9 | - | ns |
| t _r | Turn-On Rise Time | $V_{GS} = 10V, V_{DD} = 15V$ | - | 15 | - | ns |
| $t_{d(off)}$ | Turn-Off DelayTime | I_D = 30A, R_{GEN} = 3 Ω | - | 36 | - | ns |
| t_{f} | Turn-Off Fall Time | | - | 11 | - | ns |
| Drain-S | Source Diode Characteristics and I | Max Ratings | | | | |
| Is | Maximum Continuous Drain to Source Diode Forward Current | | | - | 60 | Α |
| I _{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 240 | Α |
| V_{SD} | Drain to Source Diode Forward Voltage | $V_{GS} = 0V, I_{S} = 30A$ | - | - | 1.2 | V |
| trr | Body Diode Reverse Recovery Time | I _F = 30A, di/dt = 100A/us | - | 11 | - | ns |
| Qrr | Body Diode Reverse Recovery Charge | I _F - 30A, ui/ut = 100A/us | - | 2.5 | - | nC |

Notes:

^{1.} Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

^{2.} E_{AS} condition: Starting T_J =25C, V_{DD} =15V, V_G =10V, R_G =25ohm, L=0.5mH, I_{AS} =21A

^{3.} Pulse Test: Pulse Width $\!\! \leqslant \! 300 \mu s,$ Duty Cycle $\!\! \leqslant \! 0.5 \%.$



Test Circuit

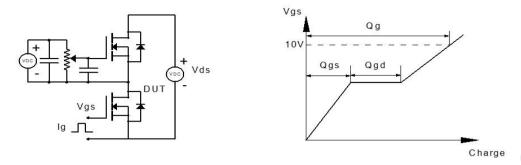


Figure 1: Gate Charge Test Circuit & Waveform

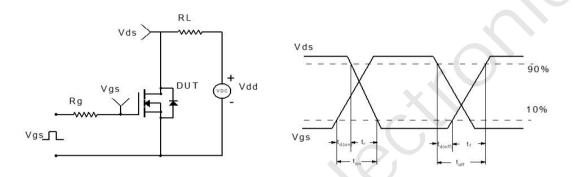


Figure 2: Resistive Switching Test Circuit & Waveform

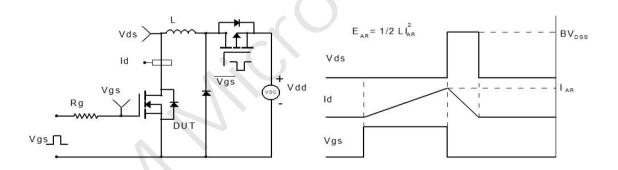


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

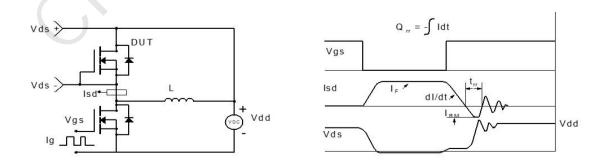
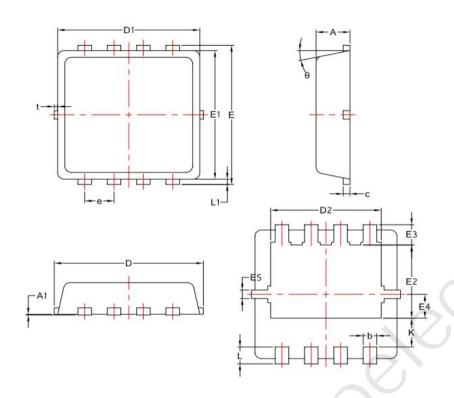


Figure 4: Diode Recovery Test Circuit & Waveform





Package Mechanical Data(PDFN3.3x3.3-8L)



| S | COMMON | | | | |
|-------------|--------|-------|------|--|--|
| M B O | | | | | |
| 0 | MIN | NOM | MAX | | |
| Α | 0.70 | 0.75 | 0.85 | | |
| A1 | 1 | 1 | 0.05 | | |
| b | 0.20 | 0.30 | 0.40 | | |
| С | 0.10 | 0.152 | 0.25 | | |
| D | 3.15 | 3.30 | 3.45 | | |
| D1 | 3.00 | 3.15 | 3.25 | | |
| D2 | 2.29 | 2.45 | 2.65 | | |
| Е | 3.15 | 3.30 | 3.45 | | |
| E1 | 2.90 | 3.05 | 3.20 | | |
| E2 | 1.54 | 1.74 | 1.94 | | |
| E3 | 0.28 | 0.48 | 0.65 | | |
| E4 | 0.37 | 0.57 | 0.77 | | |
| E5 | 0.10 | 0.20 | 0.30 | | |
| е | 0.60 | 0.65 | 0.70 | | |
| K | 0.59 | 0.69 | 0.89 | | |
| L | 0.30 | 0.40 | 0.50 | | |
| L1 | 0.06 | 0.125 | 0.20 | | |
| t | 0 | 0.075 | 0.13 | | |
| θ | 10° | 12° | 14° | | |

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